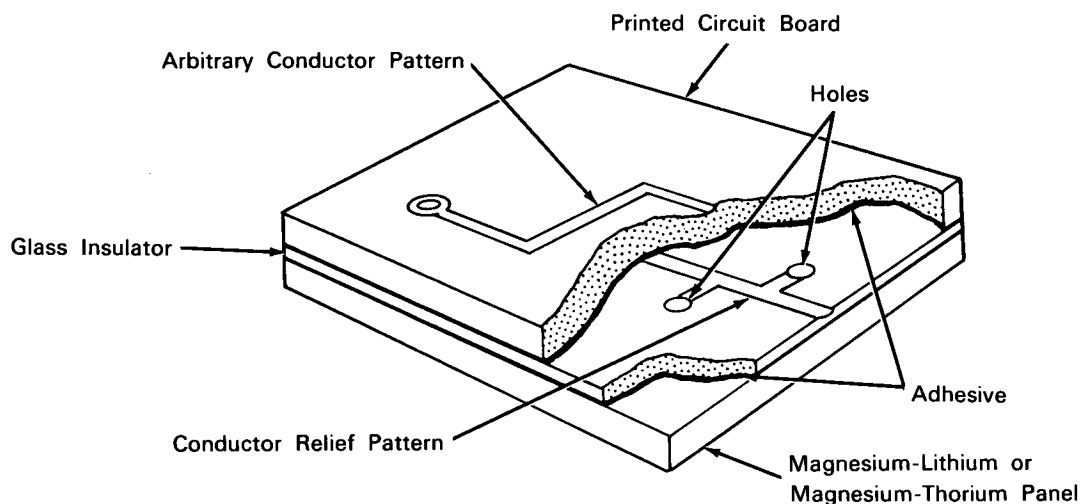


NASA TECH BRIEF



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Screening Technique Makes Reliable Bond at Room Temperature



The problem: Reliable bonding of electronic-circuit boards to magnesium-lithium and magnesium-thorium panels. High temperatures usually associated with bonding would cause warpage in the magnesium-lithium and magnesium-thorium panels, thus destroying the bond.

The solution: A stainless-steel screening technique used to lay room-temperature curing epoxy adhesive.

How it's done: A stainless-steel screen is used in laying the epoxy adhesive. Since the stainless-steel screen may be cut to any desired pattern, the adhesive can be applied to selected areas of the assembly. The epoxy adhesive is naturally aggregating. The use of a screen overcomes this deficiency and permits application of the adhesive smoothly and over limited areas.

In some applications, sufficient adhesive cannot be applied in a single screening operation to ensure proper insulation between the conductor pattern on the back side of the circuit boards and the magnesium-lithium or magnesium-thorium panels. In such a case, repeated screening operations can be performed, or, if it proves more economical, an epoxy-glass insulator plate can be incorporated into the assembly. This insulator plate must have a relief pattern on one face that matches the conductor pattern and oversize holes must be drilled through it in a pattern to match the holes provided in the circuit board. The bonding tool used is a simple press consisting of a rubber diaphragm overlaying a platform upon which the assembly is placed. Pressure is exerted upon the assembly by creating a vacuum between the diaphragm and the platform.

(continued overleaf)

Notes:

1. This technique would be useful with most thin-walled structures that experience warping during conventional bonding operations.
2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama, 35812
Reference: B65-10004

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: International Business Machines
under contract to Marshall Space Flight Center
(M-FS-227)